REMARKS

In a non-final Office Action dated January 30, 2009, the Examiner in charge of the application correctly identified the status of the claims; Claims 1-31, 33-49, and 51-94 are pending, Claims 10, 32, and 50 are cancelled, Claims 71-94 are withdrawn from consideration, and Claims 1-31, 33-49, and 51-70 are under consideration. The Examiner granted an October 17, 2003 priority date in view of Applicants' amendments to Claims 1, 25, and 48. The Examiner acknowledged that Claims 19 and 41 are free of the art. While the Examiner stated that these claims stand rejected for other reasons, no such other reasons are apparent from the Office Action. Further, Claim 20, while not explicitly stated to be allowable, was not rejected. Applicants respectfully request confirmation that Claims 19, 20, and 41 are allowable. The Examiner withdrew prior novelty and obviousness-type double patenting rejections in response to Applicants' arguments, but imposed new novelty, obviousness, and obviousness-type double patenting rejections. Applicants respond to each issue separately below.

Rejections under 35 U.S.C. § 112, second paragraph

The Examiner rejected Claims 11-13, 33-35, and 51-53 for alleged indefiniteness for depending on cancelled claims. Applicants amend the claims to correct the dependency of these claims. Reconsideration is respectfully requested.

Nonstatutory obviousness-Type Double Patenting Rejection

The Examiner alleged that Claims 1, 4-7, 17, 25, 28-31, 39, 45-47, and 48 are not patentably distinct from Claim 1 of commonly-owned U.S. Patent No. 7,049,074 (Schwartz I), in view of Fuchs *et al.* The Examiner further alleged that Claims 1, 3, 4-7, 17, 23-25, 27-31, 39, and 45-48 are not patentably distinct from Claims 1-2, 10, 12-13, 15-16, and 26-27 of commonly-owned U.S. Patent No. 6,509,158 (Schwartz II), in view of Fuchs *et al.*

Schwartz I claims methods for preparing a nucleic acid molecule elongated and fixed on a planar surface coated with a positively charged substance such that the molecule is individually analyzable and accessible for enzymatic reactions and/or hybridization reactions. Schwartz II claims a method for characterizing a nucleic acid molecule elongated and fixed along its length onto a solid planar surface so that the molecule is individually analyzable and accessible for enzymatic reactions. Fuchs, filed after Applicants' application, but having a priority date six months earlier, teaches methods for positioning and elongating polymers in microchannels.

Applicants submit that the invention is patentably distinct from Schwartz I and II. Schwartz I and II are inadequate to render the pending claims obvious in view of Fuchs because Fuchs neither teaches laminar flow, nor the periodic reversal of laminar flow through microchannels, as recited by the claims. Similarly, Schwartz I and II do not teach periodically reversing the laminar flow to cause the polymeric molecule to hover in an elongated state. In fact, Schwartz I and II teach that the molecule is fixed on a planar surface, not hovering within the micro-channel. Reconsideration is respectfully requested.

Rejection under 35 U.S.C. § 102(a) over Fuchs

The Examiner alleged that Fuchs anticipates Claims 1-3, 8-9, 11-12, 16-18, 25-27, 33-34, 38-40, 42, 48, 51-52, 56, 64, and 69. Fuchs does not teach periodically reversing the laminar flow to cause the polymeric molecule to hover in an elongated state. The described "slowing" or "stopping" of the flow is not equivalent to reversing the flow. Fuchs' paragraphs [0105] and [0106], cited by the Examiner, teach a solution distinct from laminar flow hovering for holding the polymer in an elongated state, namely a specialized micro-channel structure that combines a narrower and wider channel width, referred to as "crimp" (Fuchs, paragraph [0106]; FIG. 20).

Fuchs teaches alignment of polymeric molecule through a velocity gradient (paragraphs [0006]-[0008] and [0080]; Claims 1-11 and 17). The velocity gradients employed by Fuchs are created by micro-channels that vary in width along their length (e.g., paragraph [0011]; FIG. 20, 21) or by using obstacles that create stagnation points (e.g., paragraph [0085]; FIG. 14). Variations in the micro-channel width or obstacles within the micro channel alter the path of the carrier fluid flow lines (Fuchs, abstract, FIG. 5, FIG. 6, FIG. 12), in some instances even separating the flow lines altogether (Fuchs, abstract, FIG. 14, FIG. 18) such that the flow lines are no longer parallel. In contrast, Applicants' methods employ laminar flow having liquid flow lines all substantially parallel to each other along a full length of the micro-channel. Applicants amend the claims to clarify this distinction. Support for this amendment is provided by paragraph [0087] and FIG. 2. Reconsideration is respectfully requested.

Rejection under 35 U.S.C. § 103(a) over Fuchs *et al.*, in view of Chan *et al.*

The Examiner alleged that Claims 4-7, 13-15, 23-24, 28-31, 35-37, 45-47, 49, 53-55, 57, 60-61, 63, 65-68, and 70 are obvious over Fuchs, in view of Chan. Fuchs does not anticipate or make obvious the amended claims, as discussed above. Chan does not bridge the gap between Fuchs and the claimed invention. Chan teaches methods for determining the velocities of single elongated polymers and for determining the distance between landmarks on single polymers. According to the Examiner, Chan teaches reactants that can be restriction enzymes or a second polymeric molecule, reacting absorbed polymers with a reactant, controlling the fluid flow, separating coiled and uncoiled molecules, and image analysis of elongated and unelongated molecules. However, Chan does not teach periodically reversing the laminar flow to cause the polymeric molecule to hover in an elongated state. Further, Chan does not teach that the flow lines are parallel to each other along the full length of the micro-channel. Reconsideration is respectfully requested.

Rejection under 35 U.S.C. § 103(a) over Fuchs *et al.*, in view of Chan *et al.*, in further view of Bensimon *et al.*

The Examiner alleged that Claims 21, 22, 43, 44, and 58, 59 are obvious over Fuchs, in view of Chan, and in further view of US Patent No. 6,265,153 to Bensimon *et al.* Fuchs alone or in combination with Chan does not teach or make obvious Applicants' invention, as explained above. Bensimon does not overcome the shortcomings of Fuchs and Chan. Bensimon merely teaches removing a coverslip to which a molecule is attached for analysis, which, according to the Examiner, made obvious to one of skill in the art to remove a micro-channel wall. Bensimon's two coverslips are not equivalent to a micro-channel and, therefore, removing a coverslip does not make obvious removing a micro-channel wall. Further, Bensimon teaches that the molecule is attached to the coverslip, while the molecule is not attached in Applicants' invention. Reconsideration is respectfully requested.

Fees

A petition for a three-month extension of time accompanies this response so that it will be deemed to have been timely filed. No other extension of time is believed due; however, if any additional extension is due, in this or any subsequent response, please consider this to be a petition for the appropriate extension and a request to charge the petition fee to Deposit Account No. 17-0055. Likewise, no additional fees are believed due; however, if any fees are due, in this or any subsequent response, please charge Deposit Account 17-0055.

Respectfully submitted,

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